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The influence of the perceived consequences of refusing to share injection equipment among injection drug users: Balancing competing risks

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Abstract

Injection drug users (IDUs) are at risk for HIV and other bloodborne pathogens through receptive syringe sharing (RSS) and receptive paraphernalia sharing (RPS). Research into the influence of the perceived risk of HIV infection on injection risk behavior has yielded mixed findings. One explanation may be that consequences other than HIV infection are considered when IDUs are faced with decisions about whether or not to share equipment. We investigated the perceived consequences of refusing to share injection equipment among 187 IDUs recruited from a large syringe exchange program in Los Angeles, California, assessed their influence on RSS and RPS, and evaluated gender differences. Two sub-scales of perceived consequences were identified: structural/external consequences and social/internal consequences. In multiple linear regression, the perceived social/internal consequences of refusing to share were associated with both RSS and RPS, after controlling for other psychosocial constructs and demographic variables. Few statistically significant gender differences emerged. Assessing the consequences of refusing to share injection equipment may help explain persistent injection risk behavior, and may provide promising targets for comprehensive intervention efforts designed to address both individual and structural risk factors.

Keywords

Injection drug use; HIV; gender; perceived consequences; syringe sharing

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1. Introduction

Injection drug users (IDUs) are at risk for a number of negative health outcomes, including human immunodeficiency virus (HIV) infection (Aceijas, Stimson, Hickman, & Rhodes, 2004). Behaviors associated with infection with HIV and other bloodborne pathogens such as hepatitis C virus (HCV) among IDUs include receptive syringe sharing (RSS) and receptive paraphernalia sharing (RPS); that is, the use of previously used injection equipment such as syringes, “cookers” (i.e., receptacles for preparing drug solution), or filtration cottons (Centers for Disease Control and Prevention, 1998; Garfein, Vlahov, Galai, Doherty, & Nelson, 1996). Though the frequency of RSS and RPS in the U.S. has declined dramatically since the beginning of the HIV epidemic (Des Jarlais & Semaan, 2008), recent surveillance surveys report that up to one-third of IDUs continue to practice injection behaviors that put them at risk for HIV infection (Centers for Disease Control and Prevention, 2009; van Ameijden, Langendam, Notenboom, & Coutinho, 1999).

Myriad studies have examined correlates and predictors of risky injection behaviors. Many employ cognitive behavioral theories of health behavior, which emphasize characteristics of the individual (Gibson, Choi, Catania, Sorensen, & Kegeles, 1993). A theoretical construct common to many cognitive behavioral theories is the perceived risk of a particular negative outcome (e.g., HIV infection). Some authors have offered critiques of this construct, noting that differences in the measurement, study design, or study subgroups may contribute to the mixed findings (Kowalewski, Henson, & Longshore, 1997; Weinstein, 1999). In a review of research with smokers, Weinstein (1999) discusses the challenges posed by different operational definitions of perceived risk, and finds that across studies smokers tend to minimize the size of the risk posed to them by smoking and to believe that the risk applies more to others than themselves. He postulates that this pattern is also likely to be found with other risky behaviors. In research focusing on HIV, the perceived risk of HIV associated with sexual or injection-related behaviors has been described as “perceived risk”, “perceived susceptibility”, and “perceived vulnerability” (Kowalewski, et al., 1997). Theories such as the Health Belief Model (Strecher & Rosenstock, 1997) and the Theory of Reasoned Action (Fishbein, 1967) and Protection Motivation Theory (Rogers & Prentice-Dunn, 1997) predict that individuals who perceive a high risk of HIV infection associated with RSS or RPS, or who perceive themselves to be highly susceptible to HIV infection via RSS or RPS, will be less likely to engage in injection risk behavior. However, findings regarding the association between perceived risk for HIV and injection risk behavior have been mixed. (Bailey, et al., 2007; Booth, 1994; Mitchell & Latimer, 2009; Robles, et al., 1995; Smyth, Barry, & Keenan, 2001; Stein, Dubyak, Herman, & Anderson, 2007; Wood, et al., 2005).

As with smokers, these mixed findings may be due to methodological differences. But another possible explanation is that IDUs may consider different ultimate outcomes - a ‘hierarchy of risks’ - when they make decisions about whether or not to engage in HIV risk behaviors (Kowalewski, et al., 1997). That is, consequences other than HIV infection might be equally or more important than the perceived risk of HIV in influencing injection risk behavior. Based on principles set forth by behavioral decision theory, others have discussed the importance of eliciting all the possible consequences of a behavior, optimally from the respondents themselves (see Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Quadrel, 1993 for a discussion of methodological issues). In research with IDUs, consequences such as drug withdrawal (Connors, 1992), rejection or social isolation from peers (Bourgois & Schonberg, 2009), or the risk of losing one’s share of a pooled drug purchase (Koester, 1996; Koester, Glanz, & Baron, 2005) can result from a decision to engage in an otherwise protective behavior – refusing to share injection equipment. That is, when faced with a decision about whether or not to share injection equipment, the risk of HIV infection that

could result from sharing competes with the risk of drug withdrawal, social rejection, or loss of drugs that could result from refusing.

In the current study, we hypothesized that the perceived consequences of refusing to share injection equipment would be associated with injection risk behavior, independent of other psychosocial constructs commonly used to explain injection risk behavior (e.g., perceived risk of HIV or HCV, self-efficacy for safer injection, response efficacy, perceived severity of HIV or HCV, knowledge, and peer norms for safer injection). Among IDUs, certain subgroups may be particularly vulnerable to HIV; female IDUs are one such group (Fennema, van Ameijden, van den Hoek, & Coutinho, 1997; Garfein, et al., 1996). While biological factors influencing drug metabolism may form the foundation of some differences (Hankins, 2008), the social environment in which women use drugs has been identified as an important contributor to elevated HIV risk (Miller & Neaigus, 2001). This includes characteristics such as the types of individuals that comprise women's drug-using networks (Barnard, 1993; Cruz, et al., 2006; Latkin, et al., 1998; Miller & Neaigus, 2001; Montgomery, et al., 2002), and dynamics of power and control over women's access to drugs, injection paraphernalia, and other resources (Barnard, 1993; Bourgois, Prince, & Moss, 2004; Epele, 2002; MacRae & Aalto, 2000; Simmons & Singer, 2006). Therefore, we further hypothesized that women would identify more social consequences, and expected that social consequences would be more influential in explaining injection risk behavior among women.

2. Material and Methods

2.1 Sample

Data were collected as part of a sequential mixed-methods study conducted at a large syringe exchange program (SEP) in Los Angeles, California from July 2008 to April 2009. Briefly, in the first phase of the study 26 IDUs participated in in-depth, qualitative interviews that explored the circumstances surrounding their most recent injection episode involving RSS or RPS. Data from those qualitative interviews were used to construct the perceived consequences items for the current analysis, as will be described in section 2.2.3 below.

For the second phase of the study, 187 IDUs were sampled from the same SEP to participate in a quantitative survey. Data were collected via Audio Computer Assisted Interview (ACASI), which has been shown to reduce bias associated with socially desirable reporting of sensitive behaviors among IDUs (Des Jarlais, et al., 1999). Recruitment employed time-location sampling (Stueve, O'Donnell, Duran, San Doval, & Blome, 2001) and was conducted for approximately 16 hours per week on randomly selected days and times that the SEP was open. Eligible participants were ≥ 18 years old, had injected in the past 30 days, and had not participated in the first phase of the study. Current IDU status was assessed by visual examination of injection stigmata and through a series of screening questions that evaluated the participant's knowledge about typical injection procedures (Garfein, Swartzendruber, et al., 2007). Though the population of SEP participants is approximately 25% female, the sampling strategy was adjusted so that at least 33% of the sample was female in order to facilitate gender comparisons. Eligible participants provided written informed consent and were compensated \$25 for their participation. The University of Southern California Health Sciences Institutional Review Board approved all study procedures.

2.2 Measures

2.2.1 Demographics—Demographic characteristics included age, sex, race/ethnicity, education, and history of incarceration. Housing status was assessed by asking where participants had lived or slept the most in the past 30 days and whether they considered themselves homeless in the past 30 days. HIV and HCV status was assessed based on self-report and coded as negative, positive, or unknown (if participants reported never having been tested).

2.2.2 Drug use and injection risk behavior—Current drug use was assessed with three variables: injection drug of choice (i.e., drug most frequently injected in the past 30 days), and daily and weekly frequency of drug injection. Injection risk behavior was assessed in a series of questions used in other large-scale studies of IDUs (Garfein, Golub, et al., 2007; Needle, et al., 1995). Four items assessed the frequency with which individuals engaged in each risk behavior in the past 30 days (0–4; “never” – “almost always”): 1) RSS, 2) prepared drugs in a used cooker, 3) used a cotton filter previously used by anyone else, 4) used rinse water previously used by anyone else. For some analyses, the three paraphernalia items were collapsed into a single variable representing RPS.

2.2.3 Perceived consequences—Perceived consequences were measured using a series of items developed from qualitative data collected in the first phase of the larger mixed-methods study. In the first phase, participants were asked to describe their most recent risky injection episode and to describe the consequences that they believe would have occurred had they refused to share on that occasion. The qualitative data were analyzed in a series of steps informed by Grounded Theory (Strauss & Corbin, 1997), which involved: 1) reading the full transcripts and “memoing” initial impressions (Miles & Huberman, 1994), 2) developing a list of *a priori* codes from the literature that were supplemented with emergent themes from the transcripts, 3) applying the codes to the transcripts using ATLAS.ti to organize the data into groups based on the themes, 4) re-reading the transcripts in their entirety to create a summary of each “case”, and 5) generating thematic reports containing blocks of coded text which were then compared and contrasted to identify common themes. More details about the method and findings from the qualitative analysis are described in detail elsewhere (Wagner, Lankenau, et al., 2010). In the second phase, participants were asked how frequently each of the 11 consequences influenced their decisions about equipment sharing in the past 30 days (0–4; “never” – “almost always”). For example, “How often did the possibility of becoming dopesick (i.e., experiencing withdrawal symptoms) influence whether or not you used a syringe that had been used before?” The questions were asked separately for RSS and RPS. Participants were then asked to describe the importance of the consequence by indicating how much of a problem it would be if it were to occur (1–4; “not much of a problem” – “a very big problem”). For example, “How much of a problem would it be for you if you were dopesick?” The importance was used to weight the consequences, similar to recommendations made by the Theory of Reasoned Action (Fishbein, 1967), since more severe consequences may be more salient in their influence on behavior (Colon, et al., 2005).

2.2.4 Psychosocial scales—Perceived risk of HIV/HCV was defined as the probability that the threat (i.e., HIV or HCV infection) will occur given certain conditions or behaviors (Millstein & Halpern-Felsher, 2002). Four questions were developed for this study that asked how likely subjects think it is that they will become infected with HIV (or HCV) via RSS or RPS, rated on a 4-point scale from “very likely” to “very unlikely”. Questions were asked separately for risk to HIV and HCV infection. The items had Cronbach’s alphas of 0.86 for HIV and 0.89 for HCV.

HIV/HCV knowledge was measured using 14 items developed for use among IDUs (Garfein, Golub, et al., 2007), which assessed knowledge about the natural history of HIV and HCV infection (e.g., “You can tell by looking at a person that they have HIV infection. [True/False]”) and the relative risk of injection-related behaviors (e.g., “Re-using your own syringe is just as safe as using a brand new syringe every time [True/False]”). The scales were originally designed to represent two subscales – however, the internal consistency of the scales was low (Cronbach’s alphas = 0.44 and 0.24). We used exploratory factor analysis (using the same EFA procedure described in section 2.3) to select the six items that loaded most strongly on a single HIV/HCV knowledge factor, and calculated the proportion of correct answers to these six items to represent HIV/HCV knowledge. This six-item scale had a Cronbach’s alpha of 0.70.

Perceived severity, representing the degree of harm associated with HIV and HCV infection (Rogers & Prentice-Dunn, 1997), was measured using eight questions adapted from a study based on the Health Belief Model (Falck, Siegal, Wang, & Carlson, 1995) such as “Getting HIV is the worst possible thing that could happen to me,” rated on a 4-point scale from “strongly agree” to “strongly disagree”. Questions were asked separately for the severity of HIV and HCV infection. In the current study, these items had a Cronbach’s alpha of 0.79 for HIV and 0.81 for HCV.

Self-efficacy for safer injection was measured using six items such as “I can avoid sharing a syringe even if I am dopesick or in withdrawal”, rated on a 4-point scale from “strongly agree” to “strongly disagree”, which have shown good internal consistency in other studies (Garfein, Golub, et al., 2007). In the current study, these items had a Cronbach’s alpha of 0.92.

Response efficacy was measured using six questions that assess one’s confidence that a particular activity will reduce the risk of contracting HIV or HCV on a four-point scale of “definitely will not” to “definitely will” (e.g., “Using a brand new syringe every time will reduce my chances of becoming infected with HIV”). The items were developed for the current study, based on previous work (e.g., Falck, et al., 1995). In the current study, these items had a Cronbach’s alpha of 0.94.

Social norms for syringe sharing were measured using two items developed for use among IDUs (Garfein, Golub, et al., 2007) based on the work of others (Jamner, Wolitski, Corby, & Fishbein, 1998). Questions elicited views about the expectations of peers regarding syringe and paraphernalia sharing, for example, “People I inject with think that cookers, cotton or water should never be shared when they inject,” measured on a four-point scale from “strongly disagree” to “strongly agree”.

2.3 Analysis

Because more severe perceived consequences are likely to be more salient in their influence on behavior (Colon, et al., 2005), we weighted each consequence item by its problem score (“not much of a problem” = “a very big problem”) by creating a product term (i.e., consequence $\times$ problem), similar to recommendations made by the Theory of Reasoned Action (Fishbein, 1967). We used exploratory factor analysis (EFA) to examine the psychometric properties of the perceived consequences items, separately for each behavioral outcome (RSS and RPS). In each analysis, the 11 weighted items were entered using promax oblique rotation. Our threshold for retaining items was a minimum factor loading >0.40 on factors with a minimum Eigenvalue of 1.0. The EFA yielded two factors (Table 1) and all items were retained. We used the mean of the weighted items representing each factor to create sub-scales. Sub-scales were standardized so that each had a mean of zero and standard deviation of one. The first subscale consisted of items relating to structural or external

consequences (i.e., threat of arrest for drug paraphernalia or drug possession, risk of losing housing, financial hardship such as having to buy new equipment or losing out on a shared drug purchase, or inconvenience in finding new equipment). The second sub-scale consisted of social or internal consequences (i.e., risk of offending injection partner(s) based on a perceived lack of trust or accusation of HIV-positive status, risk that injection partner(s) would lose their share of the drug purchase if preparation equipment was not shared, risk of having to forgo drug use). Internal consistency reliability was assessed using the Chronbach's alpha, which was moderate for all factors, ranging from 0.69 to 0.85. No substantial increases in alpha for any of the sub-scales could have been achieved by eliminating items.

The factor structure was nearly identical for the questions relating to each behavioral outcome, with one exception; the item referring to the threat of experiencing withdrawal symptoms (i.e., becoming "dopesick") loaded on the structural/external factor in the questions related to syringe use, while in the questions related to paraphernalia use it loaded on the social/internal factor. Due to the inconsistency in the loading of the "dopesick" item, we conducted post-hoc analyses that removed the "dopesick" item from the factors and controlled for it separately as a covariate in the regression models. Results from these analyses (not shown) yielded conclusions similar to those described below (section 3.3), therefore we elected to retain the factor structure indicated by the initial EFA for this report.

Linear regression analyses were conducted separately for RSS and RPS. A composite score for RPS was created by taking the mean of the items that assessed the frequency of using previously used cookers, cottons, and rinse water, similar to others (Booth, Kwiatkowski, & Weissman, 1999; Garfein, Golub, et al., 2007). Because the residuals were skewed, we log-transformed the dependent variables to normalize the distribution of the residuals. The regression models were created in a series of steps. First, in "model 1" we regressed the dependent variable on the psychosocial scales and demographic covariates selected based on previous studies (sex, age, HIV and HCV status, and current homelessness). Second, in "model 2" we added the perceived consequences scales to model 1. Third, we performed an F-test using the Extra Sums of Squares Principle to determine whether the addition of the perceived consequences scales contributed significantly to model fit. Fourth, we assessed moderating effect of gender on the association between the perceived consequences scales and injection risk behavior by including product terms (gender $\times$ perceived consequences sub-scales) in the regression and assessing their statistical significance. If the interaction terms did not achieve statistical significance they were dropped from the regression model.

Gender differences in demographics, drug use variables, and perceived consequences were tested using *t*-tests for means, and Chi-square tests or Fisher's Exact Tests for frequencies.

3. Results

3.1 Sample Description

Table 2 describes the demographics and drug use behavior of the sample. Participants were ethnically diverse; 37% were Hispanic/Latino, just under one-third were white, and 20% were African American, with smaller proportions of Native American/Hawaiian Native and Asian/Pacific Islanders. The sample had an average age of 43 years (range: 19–67) and, by design, was 35% female (Table 2). Few significant differences between men and women were detected. Overall, over three-fourths reported ever being homeless, and 74% reported being homeless in the past 30 days. Almost all (92%) had a lifetime history of incarceration, and just over one-quarter reported being incarcerated in the past 30 days. Men were significantly more likely to report being ever incarcerated ($p < 0.01$), but were as likely as women to report recent incarceration. Half did not graduate high school. Eighty-five percent

had ever been tested for HIV, and 9% of those reported being HIV positive. Men were significantly more likely than women to report being HIV positive ($p < 0.01$). Seventy-four percent had ever been tested for HCV, and 59% of those reported being HCV positive.

3.2 Drug Use and Injection Risk Behavior

The average age at IDU initiation was 23 years ($SD = 8.3$); the average participant had been injecting for 20 years (Table 2). Participants reported injecting an average of 4 times per day ($SD = 2.4$; median = 3.0; range: 1.0–17.0), 6 days per week ($SD = 1.4$; median = 7.0; range: 1.0–7.0).

The majority of individuals identified heroin as the drug most frequently injected in the past 30 days ($n=165$; 88%); the remainder reported methamphetamine, crack cocaine, powdered cocaine, prescription drugs, or a combination of drugs. In terms of injection risk behaviors in the past 30 days, 52% used a previously used cotton, 46% used previously used rinse water, 49% used a previously used cooker, 42% backloaded with used equipment, and 36% reported RSS. No significant gender differences were detected in drug use or injection risk behavior.

3.3 Association Between Perceived Consequences, Psychosocial Constructs, and Injection Risk Behavior

Summary statistics for the four perceived consequences sub-scales are shown in Table 3. There were no significant differences in the mean or median values based on gender.

Receptive syringe sharing—In model 1, which regressed log RSS on the psychosocial scales and demographic covariates, greater self-efficacy for safer injection was associated with less RSS (Table 4), and recent homelessness was associated with more RSS. In model 2, which included the perceived consequences sub-scales, participants who reported higher scores on the measure of social/internal consequences reported more frequent RSS, while those who reported higher self-efficacy for safer injection reported less frequent RSS (all $p < 0.05$). The significant associations between injection risk behavior and homelessness did not persist in model 2, though an association between older age and less frequent RSS did achieve statistical significance. Including the perceived consequences sub-scales significantly improved model fit ($F_{2, 167} = 5.27$, $p = 0.006$). The product terms testing the moderating influence of gender on the association between perceived consequences and injection behavior were not statistically significant (all $p > 0.05$) and were therefore dropped from model 2.

Receptive paraphernalia sharing—In model 1, which regressed log RPS on the psychosocial scales and demographic covariates, self-efficacy and peer norms against paraphernalia sharing were significantly inversely related with RPS (all $p < 0.05$; Table 4). Individuals who reported being HCV positive and who were currently homeless also reported more RPS. In model 2, which included the perceived consequences subscales, social/internal perceived consequences were again significantly and positively associated with increased injection risk behavior ($p = 0.01$). The significant negative associations between RPS and both self-efficacy and peer norms against paraphernalia sharing persisted (all $p < 0.05$). Current homelessness continued to be associated with increased RPS, while the association with positive HCV status became marginally significant ($p = 0.06$). Including the perceived consequences scales significantly improved model fit ($F_{2, 167} = 4.99$, $p = 0.008$). The product terms testing the moderating influence of gender on the association between perceived consequences and injection behavior were not statistically significant (all $p > 0.05$) and were therefore dropped from model 2.

4. Discussion

This study was designed to assess the influence of the perceived consequences of refusing to share injection equipment, after accounting for the influence of other theoretically-important psychosocial correlates including the perceived risk of HIV and HCV, self-efficacy for safer injection, perceived severity of HIV/HCV, knowledge, and social norms. Based on items derived from qualitative interviews we identified two subscales of perceived consequences: internal/social and external/structural consequences. The inclusion of the perceived consequences measures contributed significantly to the explanation of risky injection behavior, independent of other constructs. The measure of perceived consequences had acceptable internal consistency reliability and a factor structure consistent with the theoretical underpinnings of the study, suggesting that it may also have good validity, though further research will be needed to establish whether the measure correlates with other theoretically-related constructs.

In this sample, the social/internal consequences of refusing to share injection equipment were associated with increased reporting of both RSS and RPS, while structural/external consequences were not. Alcohol myopia theory (Steele & Josephs, 1990) describes a confluence of pharmacological and environmental effects that lead to short-sighted information processing. That is, individuals experiencing alcohol intoxication may be limited in their ability to respond to external cues that would ordinarily inhibit excessive or risky behavior. The effects of the most salient or immediate cues impelling behavior may be most influential in these cases, even if those cues contradict one's attitudes or intentions when sober. Importantly, both the impelling and inhibiting cues are socially and environmentally contextualized. While we did not measure alcohol intoxication in this study, it is possible that similar mechanisms could be at work here. Similarly, the concept of delay-discounting has been observed among heroin and cocaine users, in which future rewards (or negative consequences) are perceived as less valuable or important (Kirby & Petry, 2004; Kirby, Petry, & Bickel, 1999) – a “myopia for the future” that may have neurological underpinnings (Bechara & Damasio, 2002, p. 1686). In one experimental study with heroin-dependent IDUs, delay-discounting was found to be associated with syringe sharing (Odum, Madden, Badger, & Bickel, 2000).

Alternately, rather than deficits in cognitive processing or decision making, our findings may suggest that IDUs are performing a more realistic assessment of a host of consequences, and adjusting their risk perceptions and behavior accordingly. Structural/external consequences such as being arrested for possession of drugs or paraphernalia are more distal to the injection event and may be of less concern to IDUs who are already subject to high levels of policing and incarceration, often for more serious offenses (e.g., theft, violence, drug dealing). On the other hand, the risk of offending an injection partner or forgoing drugs (social/internal consequences) will likely occur immediately and frequently. Even though the rate of recent incarceration was high (28% in the past month), injection episodes that occur with partners multiple times a day may be more influential in determining habitual behavior. Taken in conjunction with these more near-term risks, the consequence of HIV infection may be perceived as especially distal and unlikely, and therefore even less powerful in explaining injection risk behavior.

Based on a considerable literature describing gender differences in injection-related risk factors for HIV and HCV infection (Anglin, Hser, & McGlothlin, 1987; Barnard, 1993; Bourgois, et al., 2004; Bruneau, et al., 2001; Clements, Gleghorn, Garcia, Katz, & Marx, 1997; Cruz, et al., 2006; Davey-Rothwell & Latkin, 2007; Epele, 2002; Evans, et al., 2003) we hypothesized that the influence of perceived consequences would vary based on gender. To the contrary, we found few associations with gender. Women reported similar rates of

syringe and paraphernalia sharing to men, there was no difference in the mean number of consequences reported by women and men, and there was no statistical interaction between gender and perceived consequences in their association with RSS and RPS. The absence of gender differences in injection risk behavior is consistent with some other epidemiological studies (Fennema, et al., 1997; Garfein, et al., 1996). Though most of the literature focusing on gender differences has emphasized differences based on the socially-situated nature of women's injection events, men's relationships with (usually male) drug using partners may also influence injection related risk, a phenomenon which has been illustrated in ethnographic work with male IDUs (Bourgois & Schonberg, 2009).

Some demographic variables were also associated with injection risk behavior. Age was negatively associated with RSS, perhaps indicative of a pattern of more risky injection behavior among younger IDUs (Fennema, et al., 1997). There was a marginally significant association between being HCV positive and RPS, which is consistent with the efficiency of parenteral transmission of HCV compared to HIV (Hagan, Thiede, & Des Jarlais, 2005). Current homelessness was strongly and significantly associated with RPS and marginally associated with RSS. Homeless IDUs may be less likely to carry injection paraphernalia due to concerns about increasing their vulnerability to harassment or arrest by law enforcement (Dickson-Gomez, et al., 2009). Similarly, IDUs who use homeless shelters are often prohibited from carrying injection supplies into the shelter and therefore may have more difficulty maintaining a supply of sterile supplies (Dickson-Gomez, et al., 2009; Wagner, Lankenau, et al., 2010). Therefore, homeless IDUs, both street-based and shelter-using, may require greater and more frequent access to injection supplies in order to reduce injection risk behavior.

4.1 Limitations

These findings should be considered in light of some limitations. Given the non-experimental design of the study, no assumptions about directionality of influence or causation can be made. Study participants were recruited from a single SEP in Los Angeles, California; therefore, our findings may not generalize to IDUs who do not access SEPs or those in other geographical areas. Grau and colleagues (2005) found that SEP customers engaged in less frequent injection risk behavior and reported higher self-efficacy for obtaining sterile syringes as compared to non-customers, but that customers and non-customers did not differ in perceived vulnerability to HIV, perceived severity of HIV, response efficacy, or social norms. Participants in our study overwhelmingly reported heroin as their drug of choice, more research will be required to know whether our findings generalize to IDUs who prefer other substances such as methamphetamine or cocaine.

The measure of perceived consequences of safer injection behavior was developed using qualitative data elicited from the same population of SEP users and therefore will require further study (including confirmatory factor analysis [CFA]) to provide evidence of its reliability and validity in a broader sample of IDUs. The absence of statistically significant associations with gender in this study should be considered in light of the preliminary nature of this assessment, as well as the relatively small sample size. The between-gender differences were small, particularly in comparison to the relatively large within-gender variance in the perceived consequences measures. Further, while significant efforts were made to enroll a sufficient proportion of women, even larger proportions may be required to detect gender differences in these measures, if they exist. Future studies with larger sample sizes and more diverse populations that employ longitudinal designs and CFA will help to generate more precise estimates and determine whether our findings are generalizable.

4.2 Implications

This study has provided preliminary evidence that IDUs identify negative consequences associated with refusing to share injection equipment, and these consequences may influence decisions about injection risk behavior above and beyond the influence of traditionally-studied theoretical constructs such as perceived risk of HIV. These findings have implications for intervention efforts. Specifically, interventions simply designed to provide HIV risk information or increase risk perceptions related to HIV may not succeed in reducing injection risk behavior if they do not address other social/internal or structural/external consequences. Interventions that assist individuals in identifying and addressing the consequences that they perceive to be most salient may be more successful than those that impose a set of pre-defined outcomes or priorities. One of the most consistent predictors of safer injection behavior is self-efficacy for safer injection (Avants, Warburton, Hawkins, & Margolin, 2000; Celentano, Cohn, Davis, & Vlahov, 2002; Falck, et al., 1995; Gibson, et al., 1993; Longshore, Stein, & Conner, 2004; Thiede, et al., 2007; Wagner, Unger, Bluthenthal, Andreeva, & Pentz, 2010). Interventions designed to increase self-efficacy in other areas may be a promising target (Kowalewski, et al., 1997), as well as interventions that help individuals assess the significance or severity of future rewards or consequences. However, individual-level interventions can be expected to have minimal effects in the absence of structural changes that help mitigate negative consequences and create environments conducive to individual- and community-level behavior change (Rhodes, Singer, Bourgois, Friedman, & Strathdee, 2005).

5. Conclusion

Our findings suggest that in addition to considering the perceived risk of HIV associated with sharing injection equipment, research should also investigate the perceived consequences of refusing to share. Decisions about whether or not to engage in risk behaviors are grounded in a “social rationality” (Kowalewski, et al., 1997), in which individuals weigh a host of potential outcomes contextualized by social and cultural values. In attempting to comply with public health recommendations to use brand new, sterile injection supplies for every injection, IDUs often face other consequences that may carry equal or more significance. In this study, consequences associated with offending injection partners, forgoing drug use, and experiencing drug withdrawal symptoms were significantly associated with higher rates of injection risk behavior, even after adjusting for perceived risk of HIV infection. Comprehensive prevention efforts should focus on helping IDUs realistically assess and minimize these consequences by addressing the entire “risk environment” (Rhodes, 2002) where risk behavior occurs, rather than focusing exclusively on heightening risk perceptions related to HIV infection.

References

- Aceijas C, Stimson G, Hickman M, Rhodes T. Global Overview of Injecting Drug Use and HIV Infection among Injecting Drug Users. *AIDS*. 2004; 18:2295–2303. [PubMed: 15577542]
- Anglin MD, Hser Y-I, McGlothlin WH. Sex Differences in Addict Careers. 2. Becoming Addicted. *American Journal of Drug and Alcohol Abuse*. 1987; 13:59–71. [PubMed: 3687885]
- Avants SK, Warburton LA, Hawkins KA, Margolin A. Continuation of High-risk Behavior by HIV-positive Drug Users: Treatment Implications. *Journal of Substance Abuse Treatment*. 2000; 19:15. [PubMed: 10867296]
- Bailey SL, Ouellet LJ, Mackesy-Amiti ME, Golub ET, Hagan H, Hudson SM, Latka MH, Gao W, Garfein RS. Perceived Risk, Peer Influences, and Injection Partner Type Predict Receptive Syringe Sharing Among Young Adult Injection Drug Users in Five U.S. Cities. *Drug & Alcohol Dependence*. 2007; 91:S39–S47. [PubMed: 17466464]

- Barnard MA. Needle Sharing in Context: Patterns of Sharing Among Men and Women Injectors and HIV Risks. *Addiction*. 1993; 88:805–812. [PubMed: 8329971]
- Bechara A, Damasio H. Decision-making and Addiction (part I): Impaired Activation of Somatic States in Substance Dependent Individuals when Pondering Decisions with Negative Future Consequences. *Neuropsychologia*. 2002; 40:1675–1689. [PubMed: 11992656]
- Beyth-Marom R, Austin L, Fischhoff B, Palmgren C, Jacobs-Quadrel M. Perceived Consequences of Risky Behaviors: Adults and Adolescents. *Developmental Psychology*. 1993; 29:549–563.
- Booth RE. Predictors of Unsafe Needle Practices: Injection Drug Users in Denver. *Journal of Acquired Immune Deficiency Syndromes*. 1994; 7:504–508. [PubMed: 8158546]
- Booth RE, Kwiatkowski CF, Weissman G. Health-related Service Utilization and HIV Risk Behaviors Among HIV Infected Injection Drug Users and Crack Smokers. *Drug & Alcohol Dependence*. 1999; 55:69–78. [PubMed: 10402151]
- Bourgois P, Prince B, Moss A. The Everyday Violence of Hepatitis C Among Young Women Who Inject Drugs in San Francisco. *Human Organization*. 2004; 63:253–264. [PubMed: 16685288]
- Bourgois, P.; Schonberg, J. *Righteous Dopefiend*. Berkeley and Los Angeles, CA: University of California Press; 2009.
- Bruneau J, Lamothe F, Soto J, Lachance N, Vincelette J, Vassal A, Franco EL. Sex-Specific Determinants of HIV Infection Among Injection Drug Users in Montreal. *Canadian Medical Association Journal*. 2001; 164:767–773. [PubMed: 11276542]
- Celentano DD, Cohn S, Davis RO, Vlahov D. Self-efficacy Estimates for Drug Use Practices Predict Risk Reduction Among Injection Drug Users. *Journal of Urban Health*. 2002; 79:245–256. [PubMed: 12023500]
- Centers for Disease Control and Prevention. Recommendations for Prevention and Control of Hepatitis C Virus (HCV) infection and HCV-related Chronic Disease. *MMWR* 1998. 1998; 47
- Centers for Disease Control and Prevention. HIV-Associated Behaviors Among Injecting-Drug Users -- 23 Cities, United States, May 2005–February 2006; *MMWR*. 2009. p. 329-332.
- Clements K, Gleghorn A, Garcia D, Katz M, Marx R. A Risk Profile of Street Youth in Northern California: Implications for Gender-Specific Human Immunodeficiency Virus Prevention. *Journal of Adolescent Health*. 1997; 20:343–353. [PubMed: 9168381]
- Colon HM, Finlinson HA, Fishbein M, Robles R, Soto-Lopez M, Marcano H. Elicitation of Salient Beliefs Related to Drug Preparation Practices Among Injection Drug Users in Puerto Rico. *AIDS and Behavior*. 2005; 9:363–375. [PubMed: 16133902]
- Connors MM. Risk Perception, Risk Taking and Risk Management Among Intravenous Drug Users: Implications for AIDS Prevention. *Social Science & Medicine*. 1992; 34:591–601. [PubMed: 1574727]
- Cruz MF, Mantsios A, Ramos R, Case P, Brouwer KC, Ramos ME, Fraga WD, Latkin CA, Miller CL, Strathdee SA. A Qualitative Exploration of Gender in the Context of Injection Drug Use in Two U.S.-Mexico Border Cities. *AIDS and Behavior*. 2006; 11:253–262. [PubMed: 16865542]
- Davey-Rothwell MA, Latkin CA. Gender Differences in Social Network Influence among Injection Drug Users: Perceived Norms and Needle Sharing. *Journal of Urban Health*. 2007; 84:691–703. [PubMed: 17682947]
- Des Jarlais DC, Paone D, Milliken J, Turner CF, Miller H, Gribble J, Shi Q, Hagan H, Friedman SR. Audio-computer Interviewing to Measure Risk Behaviour for HIV Among Injecting Drug Users: A Quasi-randomised Trial. *The Lancet*. 1999; 353:1657–1661.
- Des Jarlais DC, Semaan S. HIV Prevention for Injecting Drug Users: The First Years and Counting. *Psychosomatic Medicine*. 2008; 70:606–611. [PubMed: 18519886]
- Dickson-Gomez J, Hilairo H, Convey M, Corbett AM, Weeks M, Martinez M. The Relationship Between Housing Status and HIV Risk Among Active Drug Users: A Qualitative Analysis. *Substance Use & Misuse*. 2009; 44:139–162. [PubMed: 19142817]
- Epele ME. Gender, Violence and HIV: Women's Survival in the Streets. *Culture Medicine and Psychiatry*. 2002; 26:33–54.
- Evans JL, Hahn JA, Page-Shafer K, Lum PJ, Stein ES, Davidson PJ, Moss AR. Gender Differences in Sexual and Injection Risk Behavior Among Active Young Injection Drug Users in San Francisco (the UFO Study). *Journal of Urban Health*. 2003; 80:137–146. [PubMed: 12612103]

- Falck RS, Siegal HA, Wang J, Carlson RG. Usefulness of the Health Belief Model in Predicting HIV Needle Risk Practices Among Injection Drug Users. *AIDS Education and Prevention*. 1995; 7:523–533. [PubMed: 8924349]
- Fennema JSA, van Ameijden EJC, van den Hoek A, Coutinho RA. Young and Recent-onset Injecting Drug Users are at Higher Risk for HIV. *Addiction*. 1997; 92:1457–1466. [PubMed: 9519489]
- Fishbein, M. New York: Wiley; 1967. Readings in Attitude Theory and Measurement.
- Garfein RS, Golub ET, Greenberg A, Hagan H, Hanson DL, Hudson SM, Kapadia F, Latka MH, Ouellet LJ, Purcell DW, Strathdee SA, Thiede H. for the DUIT study team. A Peer-education Intervention to Reduce Injection Risk Behaviors for HIV and HCV Infection in Young Injection Drug Users. *AIDS*. 2007; 21:1923–1932. [PubMed: 17721100]
- Garfein RS, Swartzendruber A, Ouellet L, Kapadia F, Hudson SM, Thiede H, Strathdee SA, Williams IT, Bailey S, Hagan H, Golub ET, Kerndt P, Hanson D, Latka M. for the DUIT study team. Methods to Recruit and Retain a Cohort of Young Adult Injection Drug Users for the Third Collaborative Injection Drug Users Study/Drug Users Intervention Trial (CIDUS III/DUIT). *Drug and Alcohol Dependence*. 2007; 91S:S4–S17. [PubMed: 17582705]
- Garfein RS, Vlahov D, Galai N, Doherty MC, Nelson KE. Viral Infections in Short-Term Injection Drug Users: The Prevalence of the Hepatitis C, Hepatitis B., Human Immunodeficiency, and Human T-Lymphotropic Viruses. *American Journal of Public Health*. 1996; 86:655–661. [PubMed: 8629715]
- Gibson DR, Choi KH, Catania JA, Sorensen JL, Kegeles S. Psychosocial Predictors of Needle Sharing Among Intravenous Drug Users. *International Journal of the Addictions*. 1993; 28:973–981. [PubMed: 8407025]
- Grau LE, Bluthenthal RN, Marshall P, Singer M, Heimer R. Psychosocial and Behavioral Differences Among Drug Injectors Who Use and Do Not Use Syringe Exchange Programs. *AIDS and Behavior*. 2005; 9:495–504. [PubMed: 16237501]
- Hagan H, Thiede H, Des Jarlais DC. HIV/hepatitis C Virus Co-infection in Drug Users: Risk Behavior and Prevention. *AIDS*. 2005; 19:S199–S207. [PubMed: 16251818]
- Hankins C. Sex, Drugs, and Gender? High Time for Lived Experience to Inform Action. *International Journal of Drug Policy*. 2008; 19 95+96.
- Jamner MS, Wolitski RJ, Corby NH, Fishbein M. Using the Theory of Planned Behavior to Predict Intention to Use Condoms among Female Sex Workers. *Psychology and Health*. 1998; 13:187–205.
- Kirby KN, Petry NM. Heroin and Cocaine Abusers Have Higher Discount Rates for Delayed Rewards than Alcoholics or Non-Drug-Using Controls. *Addiction*. 2004; 99:461–471. [PubMed: 15049746]
- Kirby KN, Petry NM, Bickel W. Heroin Addicts Have Higher Discount Rates for Delayed Rewards than Non-Drug-Using Controls. *J Exp Psychol Gen*. 1999; 128:78–87. [PubMed: 10100392]
- Koester, S. The Process of Drug Injection: Applying Ethnography to the Study of HIV Risk Among IDUs. In: Rhodes, T.; Hartnoll, R., editors. *AIDS, Drugs, and Prevention. Perspectives on Individual and Community Action*. London: Routledge; 1996. p. 133–148.
- Koester S, Glanz J, Baron A. Drug Sharing among Heroin Networks: Implications for HIV and Hepatitis B and C Prevention. *AIDS and Behavior*. 2005; 9:27–39. [PubMed: 15812611]
- Kowalewski M, Henson KD, Longshore D. Rethinking Perceived Risk and Health Behavior: A Critical Review of HIV Prevention Research. *Health Education and Behavior*. 1997; 24:313–325. [PubMed: 9158976]
- Latkin CA, Mandell W, Knowlton AR, Doherty MC, Vlahov D, Suh T, Celetano DD. Gender Differences in Injection-related Behaviors Among Injection Drug Users in Baltimore, Maryland. *AIDS Education and Prevention*. 1998; 10:257–263. [PubMed: 9642423]
- Longshore D, Stein JA, Conner BT. Psychosocial Antecedents of Injection Risk Reduction: A Multivariate Analysis. *AIDS Education and Prevention*. 2004; 16:353–366. [PubMed: 15342337]
- MacRae R, Aalto E. Gendered Power Dynamics and HIV Risk in Drug-using Sexual Relationships. *AIDS Care*. 2000; 12:505–515. [PubMed: 11091783]
- Miles, MS.; Huberman, AM. *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd ed.. Thousand Oaks, CA: Sage; 1994.

- Miller M, Neaigus A. Networks, Resources and Risk Among Women Who Use Drugs. *Social Science & Medicine*. 2001; 52:967–978. [PubMed: 11234869]
- Millstein SG, Halpern-Felsher BL. Perceptions of Risk and Vulnerability. *Journal of Adolescent Health*. 2002; 31:10–27. [PubMed: 12093608]
- Mitchell MM, Latimer WW. Gender Differences in High Risk Sexual Behaviors and Injection Practices Associated with Perceived HIV Risk Among Injection Drug Users. *AIDS Education and Prevention*. 2009; 21:384–394. [PubMed: 19670972]
- Montgomery SB, Hyde J, DeRosa CJ, Rohrbach LA, Ennett S, Harvey SM, Clatts M, Iverson E, Kipke MD. Gender Differences in HIV Risk Behaviors Among Young Injectors and their Social Networks. *American Journal of Drug and Alcohol Abuse*. 2002; 28:453–475. [PubMed: 12211360]
- Needle RH, Fisher DG, Weatherby N, Chitwood D, Brown B, Cesari H, Booth R, Williams ML, Watters J, Andersen M, Braunstein M. Reliability of Self-reported HIV Risk Behaviors of Drug Users. *Psychology of Addictive Behaviors*. 1995; 9:242–250.
- Odum AL, Madden GJ, Badger GJ, Bickel WK. Needle Sharing in Opioid-dependent Outpatients: Psychological Processes Underlying Risk. *Drug and Alcohol Dependence*. 2000; 60:259–266. [PubMed: 11053760]
- Rhodes T. The 'Risk Environment': A Framework for Understanding and Reducing Drug-related Harm. *International Journal of Drug Policy*. 2002; 13:85–94.
- Rhodes T, Singer M, Bourgois P, Friedman SR, Strathdee SA. The Social Structural Production of HIV Risk among Injecting Drug Users. *Social Science & Medicine*. 2005; 61:1026–1044. [PubMed: 15955404]
- Robles RR, Canel LI, Colon HM, Matos TD, Freeman DH, Sahai H. Prospective Effects of Perceived Risk of Developing HIV/AIDS on Risk Behaviors Among Injection Drug Users in Puerto Rico. *Addiction*. 1995; 90:1105–1111. [PubMed: 7549779]
- Rogers RW.; Prentice-Dunn. Protection Motivation Theory. In: Gochman, DS., editor. *Handbook of Health Behavior Research I: Personal and Social Determinants*. New York: Plenum Press; 1997.
- Simmons J, Singer M. I Love You...and Heroin: Care and Collusion among Drug-using Couples. *Substance Abuse Treatment, Prevention, and Policy*, 1. 2006
- Smyth BP, Barry J, Keenan E. Syringe Borrowing Persists in Dublin Despite Harm Reduction Interventions. *Addiction*. 2001; 96:717–727. [PubMed: 11331030]
- Steele CM, Josephs RA. Alcohol Myopia: Its Prized and Dangerous Effects. *American Psychologist*. 1990; 45:921–933. [PubMed: 2221564]
- Stein MD, Dubyak P, Herman D, Anderson BJ. Perceived Barriers to Safe-Injection Practices Among Drug Injectors Who Remain HCV-Negative. *The American Journal of Drug and Alcohol Abuse*. 2007; 33:517–525. [PubMed: 17668337]
- Strauss, AL.; Corbin, J. *Grounded Theory in Practice*. Thousand Oaks, CA: Sage; 1997.
- Strecher, VJ.; Rosenstock, IM. The Health Belief Model. In: Glanz, K.; Lewis, FM.; Rimer, BK., editors. *Health Behavior and Health Education: Theory, Research, and Practice*. 2nd ed.. San Francisco, California: Jossey-Bass Publishers; 1997. p. 41-59.
- Stueve A, O'Donnell LN, Duran R, San Doval A, Blome J. Time-space Sampling in Minority Communities: Results with Young Latino Men Who Have Sex with Men. *American Journal of Public Health*. 2001; 91:922–926. [PubMed: 11392935]
- Thiede H, Hagan H, Campbell JV, Strathdee SA, Bailey SL, Hudson SM, Kapadia F, Garfein RS. for the DUIT study team. Prevalence and Correlates of Indirect Sharing Practices Among Young Adult Injection Drug Users in Five U.S. Cities. *Drug & Alcohol Dependence*. 2007; 91:S39–S47. [PubMed: 17466464]
- van Ameijden EJ, Langendam MW, Notenboom J, Coutinho RA. Continuing Injecting Risk Behaviour: Results from the Amsterdam Cohort Study of Drug Users. *Addiction*. 1999; 94:1051–1061. [PubMed: 10707443]
- Wagner KD, Lankenau SE, Palinkas LA, Richardson JL, Chou C-P, Unger JB. The Perceived Consequences of Safer Injection: An Exploration of Qualitative Findings and Gender Differences. *Psychology, Health & Medicine*. 2010; 15:560–573.

- Wagner KD, Unger JB, Bluthenthal RN, Andreeva VA, Pentz MA. Cognitive Behavioral Theories Used to Explain Injection Risk Behavior Among Injection Drug Users: Suggestions for Integration of Cognitive and Environmental Models. *Health Education and Behavior*. 2010; 37:504–532. [PubMed: 20705809]
- Weinstein ND. Accuracy of Smokers' Risk Perceptions. *Nicotine and Tobacco Research*. 1999; 1:S123–S130. [PubMed: 11184311]
- Wood E, Miller CL, Hogg RS, Montaner JS, Schechter MT, Kerr T. Baseline Self-perceived Risk of HIV Infection Independently Predicts the Rate of HIV Seroconversion in a Prospective Cohort of Injection Drug Users. *International Journal of Epidemiology*. 2005; 34:152–158. [PubMed: 15561747]

Table 1

Perceived consequences sub-scales and factor loadings

	Syringe		Paraphernalia	
	Structural/ external (alpha = 0.84)	Social/ internal (alpha = 0.69)	Structural/ external (alpha = 0.85)	Social/ internal (alpha = 0.70)
"If I had not used that previously used [syringe or paraphernalia]..."				
I might have gotten arrested for carrying cookers or syringes	0.77	-	0.93	-
I could have gotten kicked out of or lost housing	0.77	-	0.60	-
I would have had to spend money to get new equipment	0.77	-	0.72	-
I might have gotten arrested for drug possession	0.75	-	0.78	-
I would have had to go out of my way to get a new syringe or cooker	0.73	-	0.77	-
I might have lost my share of the drugs we were using together	0.70	-	0.63	-
I might have become dopesick	0.44	-	-	0.57
my injection partner(s) would have been angry or hurt I didn't trust them	-	0.80	-	0.73
my injection partner(s) would have lost their share of the drugs we used together	-	0.78	-	0.71
my injection partner(s) would have been angry or hurt that I thought they had HIV/AIDS	-	0.57	-	0.54
I might not have been able to get high at all	-	0.52	-	0.63

Table 2

Demographic characteristics and drug use behavior of study sample, by gender (N=187)

	Overall		Female (n=66)		Male (n=121)	
	N	%	N	%	N	%
Age (mean; SD)	42.9 (11.5)		42.2 (11.7)		43.2 (11.3)	
Race/Ethnicity:						
Hispanic/Latino	68	37.0	24	36.9	44	37.0
White	57	31.0	19	29.2	38	31.9
African American	36	19.6	9	13.9	27	22.7
Native American/Hawaiian	12	6.5	8	12.3	4	3.4
Native						
Asian/Pacific Islander	7	3.8	3	4.6	4	3.4
Other	4	2.2	2	3.1	2	1.7
Ever homeless	144	77.0	54	81.8	90	74.4
Homeless in past 30 days	107	74.3	41	75.9	66	73.3
Ever incarcerated*	172	92.0	56	84.9	116	95.9
Incarcerated in past 30 days	48	27.9	16	28.6	32	27.6
Education: Less than high school graduation or GED	94	50.3	29	43.9	64	52.9
HIV Positive ^a (n=156)*	14	9.0	1	1.6	13	14.0
HCV Positive ^a	81	58.7	35	67.3	46	53.5
Drug injected most frequently in past 30 days						
Heroin only	165	88.2	61	92.4	104	86.0
Heroin mixed with cocaine	11	5.9	3	4.6	8	6.6
Methamphetamine only	7	3.7	1	1.5	6	5.0
Other ^b	4	2.2	1	1.5	3	2.4
Injected with previously used equipment in past 30 days (Y/N)						
Syringe	67	35.8	21	31.8	46	38.0
Cooker	92	49.2	31	47.0	61	50.4
Cotton	97	51.9	30	45.5	67	55.4

	Overall		Female (n=66)		Male (n=121)	
	N	%	N	%	N	%
Rinse water	86	46.0	29	43.9	57	47.1
Age at IDU initiation (mean; SD)	22.7 (8.3)		21.9 (7.3)		22.9 (8.7)	
Number of times injected per day (mean; SD)	4.1 (2.4)		4.2 (2.4)		4.1 (2.4)	
Number of days injected per week (mean; SD)	6.3 (1.4)		6.3 (1.5)		6.4 (1.3)	

^a self-report, % of those who have ever been tested

^b includes crack cocaine, heroin mixed with methamphetamine, powdered cocaine, and prescription drugs

* p < 0.01

Table 3

Summary statistics for four perceived consequences subscales by gender (N=187)

	Mean (SD)	95% C.I.	Range
Syringe – Structural/External Consequences			
Overall	3.07 (2.14)	2.76, 3.38	0–16
Female	3.15 (3.97)	2.17, 4.12	
Male	3.02 (3.20)	2.45, 3.60	
Syringe – Social/Internal Consequences			
Overall	2.13 (2.71)	1.74, 2.52	0–14
Female	1.99 (2.81)	1.30, 2.68	
Male	2.21 (2.66)	1.73, 2.69	
Paraphernalia – Structural/External Consequences			
Overall	2.88 (3.67)	2.35, 3.41	0–16
Female	2.80 (4.06)	1.80, 3.80	
Male	2.93 (3.45)	2.31, 3.55	
Paraphernalia – Social/Internal Consequences			
Overall	2.39 (3.61)	1.87, 2.91	0–12
Female	2.41 (2.74)	1.73, 3.08	
Male	2.38 (2.61)	1.91, 2.85	

Results from multiple linear regression of perceived consequences and psychosocial scales on log syringe sharing and log paraphernalia sharing (N=186)

Table 4

	Receptive Syringe Sharing (log)			Receptive Paraphernalia Sharing (log)		
	Model 1 F = 2.68 Adj R-Sq = 0.13	Model 2 F = 3.09 Adj R-Sq = 0.17	Model 1 F = 4.23 Adj R-Sq = 0.22	Model 2 F = 4.49 Adj R-Sq = 0.25		
	Parameter estimate (SE)	p-value	Parameter estimate (SE)	p-value	Parameter estimate (SE)	p-value
Perceived Consequences of refusing to share syringes						
Structural/external						
			0.03 (0.04)	0.48	0.01 (0.04)	0.74
Social/internal			0.10 (0.04)	0.02	0.12 (0.05)	0.01
Psychosocial scales						
Self-efficacy	-0.10 (0.04)	0.003	-0.10 (0.03)	0.003	-0.12 (0.04)	0.002
Response Efficacy	0.06 (0.04)	0.17	0.04 (0.04)	0.34	0.08 (0.05)	0.07
Perceived risk (HIV)	-0.01 (0.05)	0.84	-0.03 (0.05)	0.62	-0.04 (0.06)	0.50
Perceived risk (HCV)	-0.02 (0.06)	0.76	-0.01 (0.05)	0.90	0.003 (0.06)	0.96
Severity (HIV)	0.02 (0.05)	0.74	0.02 (0.04)	0.71	0.01 (0.05)	0.80
Severity (HCV)	-0.04 (0.04)	0.32	-0.05 (0.04)	0.19	-0.06 (0.04)	0.16
HIV/HCV knowledge	-0.05 (0.04)	0.21	-0.03 (0.04)	0.49	-0.03 (0.04)	0.51
Peer norms	-0.04 (0.03)	0.23	-0.05 (0.03)	0.18	-0.10 (0.04)	0.01
Female	-0.10 (0.07)	0.17	-0.09 (0.07)	0.21	-0.08 (0.08)	0.34
Age	-0.006 (0.003)	0.06	-0.006 (0.003)	0.05	-0.004 (0.003)	0.23
HIV positive ^a	-0.20 (0.14)	0.15	-0.13 (0.13)	0.34	-0.17 (0.15)	0.25

	Receptive Syringe Sharing (log)				Receptive Paraphernalia Sharing (log)			
	Model 1 F = 2.68 Adj R-Sq = 0.13	p-value	Parameter estimate (SE)		Model 2 F = 3.09 Adj R-Sq = 0.17	p-value	Parameter estimate (SE)	
HIV status unknown ^a	-0.12 (0.11)	0.26	-0.12 (0.10)	0.23	0.14 (0.12)	0.22	0.13 (0.11)	0.24
HCV positive ^a	0.11 (0.09)	0.21	0.10 (0.09)	0.25	0.20 (0.10)	0.04	0.18 (0.09)	0.06
HCV status unknown ^a	0.14 (0.10)	0.15	0.12 (0.10)	0.23	0.12 (0.11)	0.26	0.09 (0.11)	0.38
Homeless (past 30 days)	0.20 (0.07)	0.005	0.13 (0.07)	0.06	0.33 (0.08)	<0.0001	0.26 (0.08)	0.001
Daily frequency of IDU	0.03 (0.01)	0.07	0.02 (0.10)	0.24	0.02 (0.02)	0.16	0.02 (0.02)	0.33

^a self-report